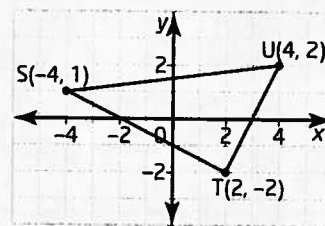
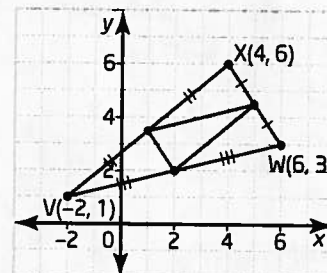


- C2** Outline how to use analytic geometry to verify that the part of the median on one side of the centroid of $\triangle STU$ is twice the length of the part on the other side.



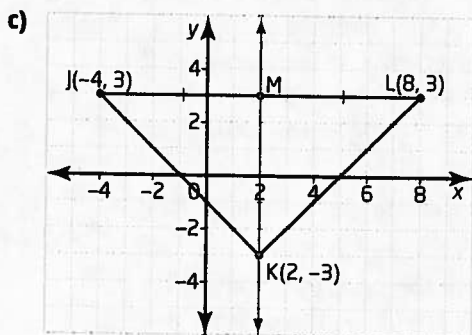
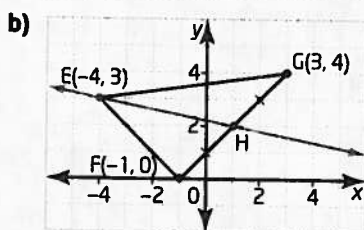
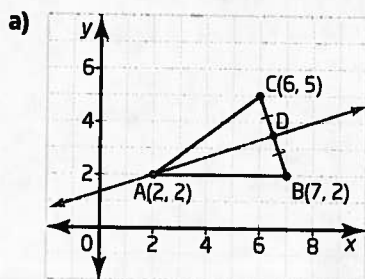
- C3** Describe how to use geometry software to verify that each line segment within $\triangle VWX$ is parallel to one of the sides of the triangle.



Practise

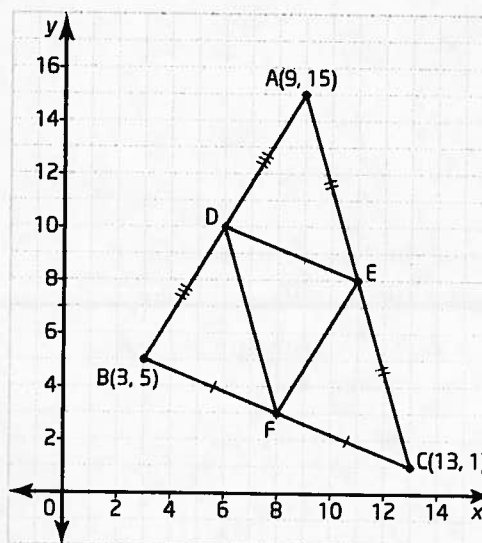
For help with question 1, see Example 1.

1. Determine an equation for the line shown with each triangle.



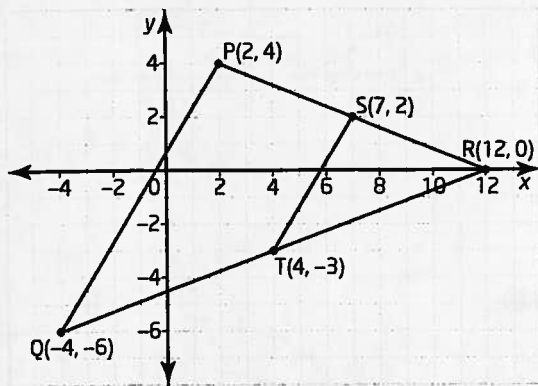
For help with questions 2 and 3, see Example 2.

2. a) Verify that DE and BC are parallel.



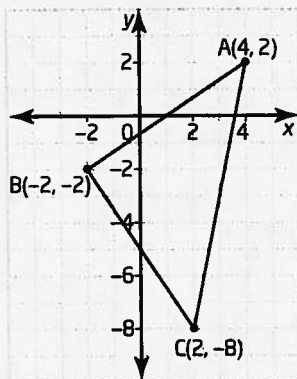
- b) List the other line segments that are parallel.
c) Verify that $DE = BF$.
d) List the other line segments that have equal lengths.

3. Verify that PQ is twice the length of ST.



Connect and Apply

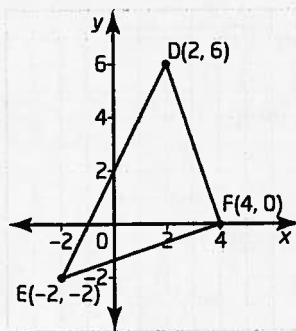
4. a) Verify that $\triangle ABC$ is isosceles.



- b) Verify that the median from vertex B is also an altitude of the triangle.

5. **Use Technology** Use geometry software to verify your answers to question 4.

6. a) Find the lengths of the sides of $\triangle DEF$.



- b) Find the slopes of the sides of the triangle.
c) Classify $\triangle DEF$. Explain your reasoning.

7. a) Draw the triangle with vertices J(8, 8), K(-5, -5), and L(5, -7). What type of triangle does $\triangle JKL$ appear to be?

- b) Use analytic geometry to verify your classification of $\triangle JKL$.

- c) Determine the perimeter of the triangle.

- d) Determine the area of the triangle.

8. **Use Technology** Use geometry software to verify your answers to question 7.

9. a) Draw the triangle with vertices P(-12, 6), Q(4, 0), and R(-8, -6).

- b) Determine the coordinates of S, the midpoint of PR, and T, the midpoint of PQ.

- c) Verify that ST is parallel to QR.

- d) Verify that ST is half the length of QR.

10. a) Draw the triangle with vertices A(3, 4), B(-2, 0), and C(5, 0). Find the midpoint of each side, and label these midpoints D, E, and F.

- b) Verify that $\triangle DEF$ is similar to $\triangle ABC$. Find the ratio of the lengths of corresponding sides of these triangles.

- c) Verify that the area of $\triangle ABC$ is four times the area of $\triangle DEF$.

- d) How is the ratio of the lengths of corresponding sides related to the ratio of the areas of $\triangle ABC$ and $\triangle DEF$?

11. **Use Technology** Use geometry software to verify your answers to question 10.

12. A landscape architect is drawing plans for a rigid triangular canopy to provide shade in a courtyard. On the drawing, the vertices of the canopy are O(0, 0), P(10, 0), and Q(2, 12). A single pole will support the canopy.

- a) Verify that the triangular canopy has a centroid.

- b) Explain why the centroid is a good location for attaching the canopy to the support pole.